



If you've been worrying about how you're going to view all those VHS cassettes when your video recorder packs up, **Colin Barrett** has the answer. You can convert your cherished analogue recordings to digital using your PC

Memorable occasions such as weddings, parties and days out used to be captured on tape. Our lives since the 1980s have been recorded and stored on VHS cassettes. However, with the arrival of DVD, video cassette recorders (VCRs) are going the way of the Dodo. Even Dixons has stopped selling them.

A much better way of storing these memories would be to transfer your recordings from their existing analogue formats to something digital. A DVD is by far the most common destination for digitised video footage, but it could be that your material will end up on YouTube, MySpace or your own website, or even be used as a video podcast.

In this feature, we'll explain everything you need to know to transfer your analogue tapes to a digital format, and how to tidy them up.

MAKING THE CONNECTION

The transfer process involves three items: the tape your footage is currently on (this might be your camcorder's tape or a VHS tape, for instance); a device to convert the video from analogue to digital; and your computer. You need to make sure that the converter box has

the same connections as the device from which you're transferring the movie footage.

Video cassette recorders, both VHS and Betamax, have composite outputs. These end in yellow, white and red plugs. The AV connecting cable that came with your camcorder will have the same red, white and yellow plugs at one end, and a plug at the other for inserting into the camcorder. Composite cables, also called RCA cables, carry the video (the pictures) and stereo (right and left) sound channels separately.



▲ You'll often find that a single multi-way AV connection breaks out into the distinct yellow, white and red RCA Phono plugs. In some cases, these carry AV signals back into the camcorder

Composite video refers to a signal in which all the picture elements are combined. It isn't the only type of analogue video connection though. There is also S-video, which separates the colour and the saturation (brightness) for better resolution and clarity.

Audio is still sent over the red and white RCA cables. To copy recordings from either an S-VHS player or Hi8 camcorder, you will need to use an S-video connection, which might also be included in the cables that came with your



▲ The S-video connector carries the component video signal only, and should replace the use of the yellow connector only when transferring S-VHS or Hi8 video cassette signals



▲ A standalone box such as Canopus's ADV555 is used to convert S-VHS signals to a DV stream via FireWire. Note the use of the S-video connector rather than the yellow composite video plug

camcorder or video player. S-video processes S-VHS and Hi8 video signals differently in order to retain the higher quality on offer, though it has no advantage when it is used with ordinary video recordings.

You may find that the device from which you want to transfer video has only SCART outputs, rather than composite or S-video. Don't worry, though, as you can buy converters. Maplin (www.maplin.co.uk) has a range of converters starting from £8.99.

GOING DIGITAL

There are several ways you can digitise your material. You could use your digital camcorder, if it has an AV input. This input is more often used as an output to play recordings direct from the camcorder to a TV set using the yellow, white and red RCA cables.

These cables are supplied with virtually all camcorders, and it is possible for the digital camcorder to work as a sort of digital recorder by accepting the signal back up the cable and on to tape or disc. If that's the case, the product manual will tell you how to attach the coloured plugs to your VCR and make a recording to the camcorder.

From the digital camcorder, you can then export the new digital recordings to your computer using the FireWire input. FireWire is also known as i.Link and IEEE1394. It is used with MiniDV and Digital8 camcorders to facilitate digital-to-digital copying. From there, the videos can be edited and copied to DVD, YouTube and so on.

A camcorder that allows AV input recording can also be used as a digital video recorder. It is worth using it to re-record your analogue tapes first and use the digital recordings as master tapes, which can subsequently be exported to the computer at any time.

Most people don't have a digital camcorder capable of doing this. However, there are other, quite simple routes.

STANDALONE CONVERTERS

Another effective way to convert from analogue to digital is to stream the video sequences direct to your computer using a standalone converter

HOW TO... Edit your digitised movies

Premiere Elements 3 is the cut-down version of Adobe's professional Premiere Pro software. It has an amazing number of features given its low price. If you shop around you can buy it for less than £60. It is ideal for tidying up digitised video clips and is designed to help first-time video makers achieve what they want quickly and easily.

In this exercise, we'll keep it simple. We're copying some analogue VHS video clips to MiniDV in a camcorder and are using Premiere Elements to pull the contents of our tape into the system via FireWire. It's just as easy to connect up a hard disk, mobile phone or PDA via USB2 and import clips, in addition to mixing them all on the timeline.

The final result of this exercise will be a complete video file that can be exported for playback on an Apple iPod at a resolution of 320x240.

1 In common with all comparable applications such as Pinnacle Studio, Ulead Video Studio and Sony Vegas, Premiere Elements provides you with a simple way to acquire new media into what Adobe labels the Available media window on the upper left of the screen. In the main part of this article, we've referred to it generically as the clip bin. Using the little Camcorder icon in the left margin, we can get media from a variety of sources, even from mobile devices and stills cameras.

In this case, we've selected to capture our newly converted MiniDV clips via FireWire. The program will now control the camcorder's playback functions and display a preview image and sound on your computer.

2 Using the same set of utilities, you can also pull other file types into your video project. This is very handy should you wish to include not just video clips but also digital pictures taken with your camera or mobile

phone, various files stored on your computer, and even images that have been scanned in to your PC. If you also have Premiere Elements 3's sister product, Photoshop Elements 5, you'll be able to import files and even modify them directly.

3 Having captured or imported a range of clips into the clip bin on the left, you can see that each individual clip is identifiable by its unique thumbnail image and file description. The thumbnail is created automatically by the software and usually shows the very first frame of the clip. For footage captured from VHS Video and Hi8 sources (even if copied to MiniDV first) you may have to split up clips manually, but it's worth the effort as it makes editing much easier. With the thumbnails now displayed, you can click each in turn to play them in the Preview Window. It's here that you can trim them at each end, prior to dragging and dropping on to the timeline, which runs from left to right across the bottom of the display.

4 As you assemble more clips along the timeline, you'll find it's an easy job to re-order them simply by dragging and dropping desired clips to a new location. To delete a clip, right-click on its icon, then select Delete Just Scene. The clip is removed from the sequence, though it is not deleted from the hard disk. It stays in your clip bin available for re-use if required. If you delete a clip by accident, you can restore it using Edit, Undo. If you have a sequence of clips you wish to move to another location, click on the first clip then, holding down the Shift key, click on the last clip. All the clips between will also be selected. You can then drag the clips simultaneously.

5 You can display the contents of the timeline in two distinct ways. We've already seen the simplified Sceneline mode, but

for more picture and sound track detail (and a greater level of control over what you're doing) there's the Timeline display option. As you can see, it's now possible to examine the video (picture) and audio (stereo sound) information more accurately. This is useful for precise trimming of a clip, or modification of the sound levels of a single clip or group of clips. Begin with the simple Sceneline mode and progress to the Timeline mode when your confidence increases.

6 In addition to spicing up your newly digitised clips with a fade-up at the beginning and perhaps even a fade-out at the end, you can also introduce transitions between scenes. Here we've selected a Page Turn transition to take the viewer from one clip to the next in a way that suggests the page of a book is being turned over. All programs of this kind have a similarly comprehensive choice where picture transitions are concerned, and experimenting with them is great fun. However, don't be tempted to overdo the transitions; they can quickly make your video look a bit tacky. Watch a range of TV programmes, and you'll notice that they're not used much.

7 Older video clips often have less-than-perfect sound levels or quality, so you must spend some time increasing or decreasing sound levels on your digitised clips. Thankfully, accurate manipulation of sound on a near frame-by-frame basis using Keyframe Control is possible in this and other programs. There's lots of capacity on the timeline for accompanying audio tracks. Using similar techniques on a clip-by-clip basis, it's also easy to modify the brightness, contrast and colour balance of your captured video footage, too.

8 Another common feature of all video editors is the ability to add titles in an endless variety of fonts, sizes and styles. Not



box, of which there are many available at relatively low cost. The most common units, from companies such as Canopus, Miglia and Pinnacle, are easy to set up and use. Simply connect the outputs of the analogue VCR or camcorder to the input sockets on the box itself and then connect the converter to your computer via either FireWire or USB2.

The conversion to digital is undertaken by the unit as the signal passes through. With the contents of your video cassette playing into the converter, your computer will receive a digital picture and sound signal, just as if it were receiving digital video footage from a MiniDV or Digital8 camcorder. Then all you need is a suitable piece of software to capture and write the video stream to the computer prior to editing and exporting it.

There are two sizes of FireWire port: six-pin and four-pin. If you're using FireWire, then you'll need to make sure your PC has a six-pin connector. A six-pin FireWire connection carries

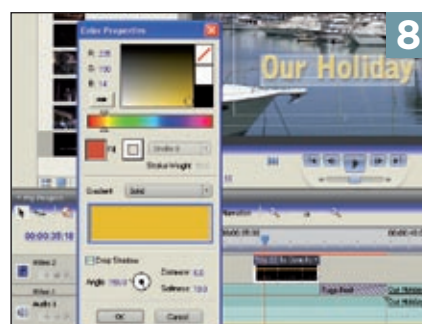
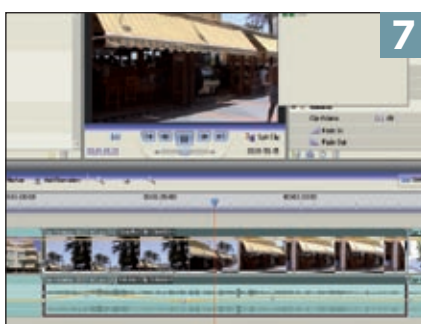
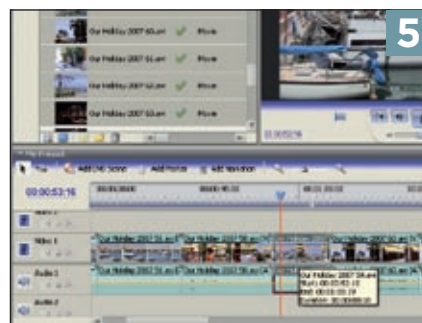
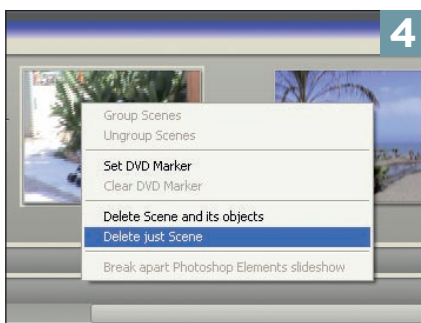
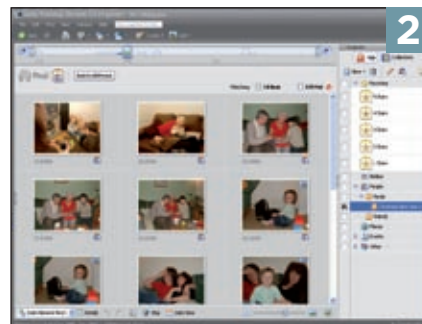
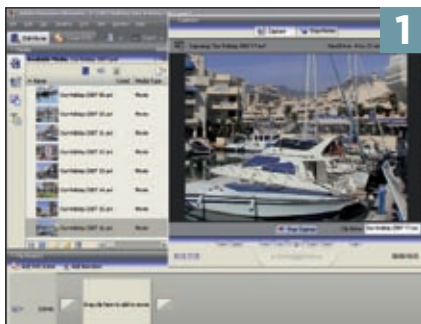
power to the external device, whereas the smaller four-pin connection (similar to that provided on camcorders) does not. The analogue-to-digital (A-D) converter probably requires powering via the computer's FireWire port (this is often called bus powering). Some A-D converters have both types. USB2 devices are capable of working in a similar manner – that is, they draw power through the USB connection from your computer.

UNDERSTANDING THE CAPTURE PROCESS

The A-D interface box takes the analogue signals and converts them to a digital stream. This is often referred to as a DV stream because, as far as the computer is concerned, it's identical to the signal coming off a MiniDV tape. However, you are also going to need special software to manage the process of capturing, which is the process of writing the digital stream to the computer's internal hard disk in a usable form.

It's possible to capture your video clips and even edit them at no additional cost whatsoever. Microsoft's Movie Maker application is a free add-on that can be used with Windows XP and Vista, and is designed to enable you to craft your own movies within minutes. The latest version provided for Windows Vista, Movie Maker 3, lets you create DVDs from your movie sequences, too. If you would like to find out how to use Movie Maker and Windows XP to put video clips on your website, read 'How to... put your videos on the web', *Shopper* August 2005.

Capturing digital video to a computer equipped with FireWire is easy. As well as Movie Maker, there are commercial packages that come at a low cost, such as Pinnacle Studio Plus 11, Ulead Video Studio 11 Plus and Adobe Premiere Elements 3. All these programs are designed to give you hassle-free control over the input device (camcorder, A-D converter, and so forth) and save the resulting digital video files to the computer's hard disk.



only do you have the freedom to choose any font that resides on your computer, but you also can use commonplace tools such as the colour thumbwheel to set the text colour and add hard and soft drop-shadows to make it stand out.

You'll also have the ability to position the title anywhere in the frame that you like, so you can place it where you feel it will best

complement the scene over which it is being superimposed. Other simple tools are included in the Titling module, giving you extra flexibility and control over the way the title appears on the screen.

9 The final step to completing your first foray into video editing is to export the project into something that can be shared with

the outside world. If you want to create a DVD, you'll be able to do this within the program itself, and it's very easy. Alternatively, you can create a video file to play on your computer in a variety of formats, and even create versions that are playable on a Sony PSP or Apple iPod Video, among other things. We selected one of the two iPod options, which gives us a screen size of 320x240 pixels.



DIGITISING VIDEO TAPE

In most video-editing software, this means playing your source video so the picture is displayed in the capture preview window and the sound can be heard via the speakers or headphones. After telling the program where it should save the clips, it takes just a single click to start the process of writing video to hard disk.

INTRODUCING THE CLIP BIN

Video capture can be done with just one click. As the video footage starts to copy, you'll see the relevant thumbnail image appearing in the folder window where the clips are stored. As each new clip starts, a new thumbnail is created, making it very easy to identify each clip. You can even give each clip a new name later. Having got this far, you're ready for the fun part: the editing.

Once a selection of home movie clips has been captured into the clip bin, you'll be eager to tidy up the sequences by cutting out the obviously bad bits, re-arranging them, adding titles and music and so on. That's where things get exciting, and it's something you can do almost immediately with any editing program.

The program's screen will contain a window in which to view one or more clips. Simply click on one of the thumbnail icons in the clip bin and then on the Play control and the selected clip will play with sound. Do the same with another. You'll see a linear section running across the bottom of the screen; this is the timeline, and it is a common element of all video-editing programs. We are able to build up our movie by dragging individual clips from the clip bin to the timeline one at a time.

MODIFYING AND DELETING CLIPS

As well as dragging clips on to the timeline, you can re-order them, trim the duration of the clip or remove them as necessary. Deleting a clip

from the timeline won't delete the clip forever. You're simply removing it from the play order. It still resides on your computer's hard disk for re-use later.

Your analogue video recordings have sound as well as moving pictures. As clips are dropped on to the project timeline, you'll see that the audio part of the timeline (the audio tracks that run in parallel to the video track containing your video clips) contains squiggly lines that represent the constantly changing sound tracks. These are collectively known as the clip's audio waveform and can be used to judge the strength of the sound on your recording. The waveform can be modified using the sound balancing controls, which are a component of all popular editing applications.

REMOVING UNWANTED FOOTAGE

Creating perfect digital copies of your home movie footage involves simple trimming of clips. As you cut, copy and paste clips, you won't incur any quality loss.

Footage taken with earlier analogue camcorders might suffer from awkward edit points where the VHS, Video8 or even Betamax tape was stopped and started. These things would be very difficult to sort out in their original formats, but thanks to the digital video-editing packages now available it's very easy. Simply trim off the beginnings and ends of the relevant clips, and you're done.

IMPROVING PICTURE QUALITY

Although the picture and audio quality of older analogue video recordings may have seemed good at the time it was shot, much of the material will appear to be oversaturated with colour and perhaps even grainy. However, all is not lost. All beginner-level, video-editing programs have some means by which your

footage can be tidied up and brought back to life. You don't actually have to dig that far down through the menus to find the utilities that can help you modify the colour balance, brightness and contrast. There might well be additional options, too, but it is best to start with these three.

As with colour photography, a regular TV picture is made up of the three primary colours: red, green and blue (RGB). Red is the busiest, or highest-frequency, colour in the light spectrum and it has a tendency to become streaky in appearance at the recording stage. Too much red looks horrible on VHS and even Video8, but we can reduce its effect in applications such as Pinnacle's Studio Plus 11 editor, whose video filter tools can be applied to either a single clip or whole sequences.

The selected filter (or video effect in this case) is dropped on to the clip, after which manual adjustments can be made. The RGB elements are adjusted using the built-in slider controls and checked using the preview screen. This is a common feature on all comparable programs. Using the same principle, it's possible to make your images brighter or darker, in addition to having control over contrast.

IMPROVING SOUND

Bad sound can put viewers off long before bad pictures do, so it's important to experiment with what the professionals call 'sound design'. Even in Movie Maker, you can add music from your favourite CD (if you have permission, of course), and add sound effects or instant music loops and phrases to spice up your project. If your holiday movie or expedition video requires explanation, write, record and mix in your own commentary. Professional results are surprisingly easy with today's software, which you'll discover almost as soon as you start to explore the possibilities. 

Clip edge Importing clips from tapeless media

Even if your source is digital, you'll want to use the programs and methods described here to edit your video clips. The software that comes with most camcorders is usually difficult to use or won't have the features that Movie Maker or Premiere Elements has.

A digital camcorder may not even save clips to digital tape, such as MiniDV. Instead, they might use smaller 8cm DVDs, memory cards or even embedded hard disks. In

copying sequences from such devices, you just need the USB2 cable that came with the camcorder or, in the case of DVD camcorders, the DVD in the relevant drive in your PC, from where it can be imported. Before you do, though, make sure the disc is finalised according to the manufacturer's instructions.

Importing is easier than the real-time capture process from analogue sources, because we're merely copying the video files

from one storage location to another.

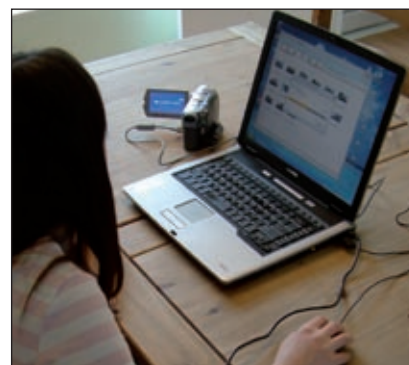
Almost all video recorded to these formats will be compressed to a format called MPEG2, which requires different handling to MiniDV or Digital8 tape sources. However, camcorder manufacturers usually include CD software to make the transfer possible. The latest versions of video-editing software from Pinnacle, Ulead, Adobe and Sony make this an easy process, too.



▲ Once you've recorded your clips using a DVD camcorder, pop the disc into your PC's DVD drive. Finalise the disc in the camcorder first, or the computer might not recognise its contents



▲ Modern tapeless camcorders such as this DVD model make clip searching and management easy thanks to the thumbnail display on the LCD screen



▲ Now that USB2 is standard on all new computers, it is possible for anyone to import and edit video clips quickly